

PATENT SPECIFICATION

(11) 1211241

1211241

DRAWINGS ATTACHED

- (21) Application No. 48253/67 (22) Filed 24 Oct. 1967
 (31) Convention Application No. D 34414/47b Gbm
 (32) Filed 27 Oct. 1966 in
 (33) Germany (DT)
 (45) Complete Specification published 4 Nov. 1970
 (51) International Classification F 16 c 33/46
 (52) Index at acceptance F2A 5C1



(54) NEEDLE BEARING CAGES

(71) We, DURKOPPWERKE GESELLSCHAFT MIT BESCHRANKTER HAFTUNG, a German Company of 29 Niederwall, Bielefeld, Germany, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The invention relates to a needle roller cage particularly for loose wheel bearings in cog-wheel variable gears, and generally for bearings with relatively stationary shaft and rotating loaded member.

According to the present invention a race guided cage for a needle roller bearing which cage has lateral rings connected by separating bridge-pieces, the bridge-piece defining roller receiving pockets therebetween and having inner and outer bridge-piece sections respectively lying inside and outside the roller pitch circle and inclined sections connecting inner and outer sections of a bridge-piece, the edges of the inner and outer bridge-piece sections extending axially of the cage and parallel to the bore thereof and, furthermore, defining inner and outer roller holding means and the inclined sections being directed obliquely of the axis of the cage, is characterised in that successive longitudinal edges of the pockets in the peripheral direction of the cage alternate between a configuration wherein the inner bridge-pieces are advanced into the related pocket and a configuration wherein the outer such pieces are so advanced such that the advanced edges of the outer sections on one bridge-piece and the advanced edge of the inner section on the adjacent bridge-piece are diagonally opposed relative to a needle roller located in the pocket there-between and the edges of the oblique sections adjacent the advanced edge of an inner or outer section form a tangent or a curve to the outer face of the roller, a roller disposed within a pocket contacting the oblique sections of the bridge-pieces at a position between the advanced edge of the outer and of the inner sections as appropriate and a position on the edge of the

oblique section between the said advanced edge and the pitch circle of the needles.

Due to the aforesaid construction of the cage or more particularly the cage bridge-pieces the so-called "corrugation" occurring on the roller member races in known bearings, that is, the formation of wave-like recesses running parallel to the bearing axis is prevented in that moments are produced which cause a movement of the cage and of the needles in the peripheral direction.

The invention will now be described further, by way of example only, with reference to the accompanying drawings illustrating one embodiment thereof and in which:—

Fig. 1 is a longitudinal section of a needle cage taken through a cage pocket;

Fig. 2 is a plan view of the needle cage of Fig. 1; and

Fig. 3 is a section on line III—III of Fig. 1.

Referring now to the drawing, a needle roller cage has two lateral rings 1 and 1' extending approximately over the whole height of the roller running space, which rings are connected together by a number of uniformly spaced bridge-pieces 2. The free spaces, or pockets, between the bridge-pieces receive the needles 3, such needles having both radial and tangential clearance within said pockets. Each separating bridge-piece 2 is divided into two sections 4 and 4' respectively adjacent the lateral rings 1, 1', a centre section 5 and two intermediate sections 6 and 6' respectively connecting sections 4 and 5, and 4' and 5. The sections 4, 4' and 5 extend parallel to the axis of the cage, whilst the sections 6, 6' are inclined thereto. The innermost edges of the cross-piece sections 4, 4' at one side of the pocket limit the radial clearance of a needle outwardly, that is to say such edges prevent a needle from falling radially outwardly from the pocket, whilst the outermost edge of the bridge-piece section 5 at the opposite side of the pocket limits the radial clearance of a needle inwardly, that is to say, the edge of this cross-piece section prevents the needle

[Price 5s. 0d. (25p)]

from falling out of the pocket at the bore side thereof. The separation of the said innermost edges of the cross-piece sections 4, 4' and the opposite outermost edge of the bridge-piece section 5 is marginally larger than the needle diameter, so that the needle can move freely within the pocket but is prevented from falling from such pocket by the edges of the bridge-piece sections 4, 4' and 5 adjacent thereto and at opposite sides thereof.

As can be best seen from Figs. 2 and 3, one edge of each of the bridge-piece sections 4, 4' extends forwardly into an adjoining pocket such that the forwardly extending edges of the separating bridge-piece sections 4, 4' and the edge of the separating bridge-piece section 5 of the bridge-piece at the opposite side of the pocket which extends into the pocket are diametrically opposed within the pocket. Within each pocket the rearwardly extending edge of the bridge-piece section 5 thus forms an inner holding edge and the forwardly extending edges of the bridge-piece sections 4, 4' outer holding edges. The faces of the oblique bridge-piece sections 6, 6' adjacent the holding edges form, first of all, a tangent or curve to the outer surface of the needle 3 and then a straight part directed parallel to an imaginary plane running through the axis of the cage and of the needle 3 in the pocket concerned. An important feature lies in the form of these faces adjacent the forwardly or rearwardly extending edges of the bridge-piece sections already been stated, form a tangent or curve 4, 4' or 5 respectively which faces, as has to the roller surface each with a roller contacting point R intermediate the forwardly extended edge K of the outer bridge-piece sections 4, 4' or of the inner such section 5, as appropriate, and a point S on the edge of the oblique section 6 and 6' which lies between the respective advanced edge and the pitch circle of the needles.

The non-advanced edges of the bridge-piece sections 4, 4' and 5 lie, according to Figs. 2 and 3, in a common plane with the adjacent straight edge of the oblique sections 6, 6'. However, these edges may also penetrate by a small amount into the pocket space, but only

so far that they cannot come into contact on the needles.

WHAT WE CLAIM IS:—

1. A face-guided cage for a needle roller bearing, which cage has lateral rings connected by separating bridge-pieces, the bridge-pieces defining roller receiving pockets therebetween and having inner and outer bridge-piece sections respectively lying inside and outside the roller pitch circle and inclined sections connecting inner and outer sections of a bridge-piece, the edges of the inner and outer bridge-piece sections extending axially of the cage and parallel to the bore thereof and, furthermore, defining inner and outer roller holding means and the inclined sections being directed obliquely of the axis of the cage, characterised in that successive longitudinal edges of the pockets in the peripheral direction of the cage alternate between a configuration wherein the inner bridge-pieces are advanced into the related pocket and a configuration wherein the outer such pieces are so advanced such that the advanced edges of the outer sections on one bridge piece and the advanced edge of the inner section on the adjacent bridge-piece are diagonally opposed relative to a needle roller located in the pocket therebetween and the edges of the oblique sections adjacent the advanced edge of an inner or outer section form a tangent or a curve to the outer face of the roller, a roller disposed within a pocket contacting the oblique sections of the bridge-pieces at a position between the advanced edge of the outer and of the inner sections as appropriate and a position on the edge of the oblique section between the said advanced edge and the pitch circle of the needles.

2. A face-guided cage for a needle roller bearing substantially as hereinbefore described with reference to and as illustrated in the accompanying drawing.

Agents for the Applicants,
SYDNEY E. M'CAW & CO.,
Chartered Patent Agents,
Saxone House,
52—56 Market Street,
Manchester, M1 1PP.

